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1. The following are the main centers of ultrasonic research in the nationalized industry of East Germany:

   a) Transformatoren-und Röhrenwerk (T.u.R., Dresden (formerly Koch und Sterzel)
   b) Funkwerk Erfurt, in co-operation with VEB Carl Zeiss, Jena
   c) AEG Berlin-Hoppegarten

   Ultrasonic research and development is also done in numerous other enterprises of the people's-owned industry, private laboratories and academic institutes. However, the centers above are the most important ones in view of the results obtained and the possible industrial, medical and strategic use of the devices developed or under development.

2. The ultrasonic laboratory of T.u.R., Dresden, is headed by Dr. (fnu) Schwarzer. In the past it has been mainly engaged in the development of devices for medical therapeutics and dosimetry. Although the laboratory is still in existence and work on therapeutic and dosimetric devices is being continued, there has been no new development in the recent past, and the number of researchers engaged there is rather small.

3. Ultrasonic research and development at the Funkwerk Erfurt is carried out in two different directions:

   a. Development of ultra-sound transmitters (Leistungssender) and ultra-sound oscillators (Leistungsschwinger) of up to 2 KW. This is done in cooperation with the ultrasonic research laboratory of VEB Carl Zeiss, Jena 1/ where an ultra-sound oscillation device (Schwingtopf) based on the West German model of Steeg and Reuter has been developed under the direction of Prof. (fnu) Schuster. 2/ This part of the ultrasonic development, done in cooperation with Zeiss-Jena, serves such purposes as atomizing liquids, making fine and stable emulsions, etc.

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b. Development of ultra-sound impulse generators (reflectoscopes) used for testing of material. This development has suffered from the lack of adequate impulse technicians at Funkwerk Erfurt. The reflectoscope developed there can be used only for testing material more than 5 cm thick.
Ultrasonic research and development at Funkwerk Erfurt is directed by (fnu) Goebel.

4. RFT Koepenick continued ultrasonic research and development carried out by Gema during the war. Under the direction of (fnu) Reinhard, an ultra-sound ranging altimeter for navigation (Echolot) was developed. The Echolot is provided with a magnetostrictive oscillator of about 20 KHz. An improved version of the Echolot is the Echograph, also developed by RFT Koepenick; it is provided with an oscillator excited by impulses and shows the depth of the sea directly in meters on a calibrated, curved scale. The Echograph also shows underwater obstructions. Use of the Echograph is limited to relatively great depths. It can be used only for depths over 20 meters; in the range between 20 and 50 meters it does not function very well. RFT Koepenick has provided the East German merchant fleet with Echographs.

5. At the end of 1951 the Zentralamt für Forschung und Technik (ZAFT) of the State Planning Commission submitted to RFT Koepenick a research order for the development of an ultra-sound iconoscope (**Ultraschallbildwandler**). This development has been and is being carried out in an ultrasonic laboratory established for this purpose and directed by Dr. R. Kaiser. Although the development project is greatly hampered by the lack of adequate equipment, such as impulse devices and vacuum pumps, the goal set for the end of 1952, indication of 400 picture points, will probably be reached. The development schedule requires indication of 40,000 picture points by the end of 1953. The **planned** uses of the iconoscope are as follows:

a. Testing of material of great thickness, such as beams, shafts, thick cables, without destruction or partial destruction of the material (Zerstörungsfreie Werkstoffprüfung).

b. **Electrotherapeutic** uses in support of and supplementary to X-ray application. It is, for instance, impossible to tell tumors from exudates by the mere application of X-rays since both have about the same density; their reaction to ultra-sound, however, is different. Another medical use is the examination of air agglomerations in body cavities.

c. Geophysical applications. The following test has been carried out successfully. Microphones were introduced into the soil over a total surface of a square kilometer, and a test explosion was touched off at a given distance from the test area. With the aid of the iconoscope the wave picture, i.e., the condition of the soil, appeared on a screen.

6. Under the general heading of medical-diagnostical development, RFT Koepenick has carried out research and development pertaining to the following devices, also under the direction of Dr. R. Kaiser. The first of these devices can be used for a number of purposes other than medical diagnostics.

a. Ultra-sound interferrometer for the measuring of the velocity and absorption of sound in liquids of 50 cubic centimeter size. The device completed by RFT makes possible measurement within ten seconds; from the measured results conclusions can be drawn concerning the inner friction, consistency, relaxation time, polymerisation constants, etc, of the matter under investigation.

b. Ultra-sound interferrometer for measurement of the same factors as above in liquids of 30 cubic millimeters size, i.e., of drop size. This device serves the purpose of investigating medical and biological objects, for instance, animal blood.

c. Small-type ultra-sound oscillator (Ultraschallkleinstschwinger) of an overall size of one millimeter. The development so far completed resulted in the construction of an oscillator of 1.6 millimeters overall size; the required smaller size type will probably be completed during the first part of 1953. The device is for medical purposes. Due to its smallness it can be introduced into the human or animal body where it will generate sound waves emanating from one single point. It is hoped that with this device, inside parts of the body, for instance, secretion organs, can be subjected to sound waves emanating from one point for the first time in medical history.

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RFT Koepenick will construct 10 models of each device mentioned in para. 6 (c).

5. The following research and development orders for 1953 were assigned to RFT Koepenick:

a. Development of an impulse generator similar to the one developed by Goebel at Funkwerk Erfurt 3/ but adequate for uses with material of a thickness down to 5 mm.

b. Development of an ultra-sound guiding device for blind people.

c. Development of a port entry device (Ultraschall-Hafeneinfahrtsgerät) based on the same principle as the Echolot mentioned above, but to be used in low depths as well as great depths, to work with very high frequency and to be guidable in all directions. The order for the development of this device stems from the DDR Büro für Wirtschaftsfragen, and its development will probably be under the surveillance of that office.

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2/ [redacted] Comment. Prof. Schuster has also been reported previously as working on ultra-sound relief picture research. 25X1

3/ [redacted] Comment. See paragraph 3b above. 25X1